

REMARKS

Status of the Claims

Claims 1 and 4-6 are pending.

Claim 1 has been amended to incorporate the subject matter of dependent claims 2 and 3.

Claims 2 and 3 have been canceled.

Claims 7-19 are withdrawn from consideration pursuant to 37 CFR 1.142(b) as allegedly being drawn to a nonelected group.

Applicant note that the only issues precluding allowance are rejections under 35 U.S.C. §§ 102, 103, discussed below.

Issues Under 35 U.S.C. § 103

Claims 1-4 are rejected to under 35 U.S.C. § 103(a) as being allegedly obvious over Tamano (U.S. 5,811,834) in view of Doi et al. (WO 03/046108), where Tanaka et al. (U.S. 2005/0106413) is used as the English equivalent. This rejection is respectfully traversed. Reconsideration and withdrawal thereof are requested.

Tamano discloses a light-emitting material for use in organo-electroluminescence devices. Tamano discloses a light emitting layer with a phosphorus containing organic compound that can be made using the wet method. Tamano discloses that a device may be made by sandwiching a light emitting layer and hole injecting layer between an anode and a cathode. Tamano fails to disclose or suggest an electronically conductive polymer that can be used as a

hole injection layer that is insoluble in alcohols. This deficiency is acknowledged in the office action. See page 4.

The secondary reference Tanaka discloses a phosphorus compound as a fluophor that is reprecipitated in methanol, and is therefore insoluble in alcohol. See Tanaka para. 0165, line 10; para. 0173, lines 22-23; para. 0194, lines 16-19). Contrarily, the present invention calls for a “phosphorus-containing organic compound [that is] soluble in... alcohols.” See Claim 1. Tanaka therefore does not suggest, motivate, or teach an organic electroluminescent element in which the hole-transporting layer is made of an organic compound insoluble in alcohols and the electron-transoprtng layer made of a nonionic phosphorus-containing organic compound soluble in alcohols and formed in this order. In fact, given the contradictory nature of the cited references and the present invention, one of ordinary skill in the art would not be motivated to use Tanaka to conceive the present invention or to combine it with Tamano in an effort to arrive at the present invention.

That is, (1) there is no suggestion or motivation for one of ordinary skill in the art to combine; (2) there is no reason to expect that the present invention would work by modifying or combining the cited references; and (3) the prior art does not teach or suggest all the features of the claimed invention.

Even assuming there was such a motivation or suggestion, secondary considerations such as “long felt but unsolved needs, [and] failure of others” may be considered to rebut an obviousness rejection. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). Examiner has cited Tamano, and specifically compounds (35) and (36), to allege that Tamano reads on Applicant’s formula (1). In doing so, some vital factors have been overlooked.

Examiner has properly indicated that Tamano explicitly states that film forming by the wet method may be accomplished using ethanol as a solvent. See Tamano col. 25 lines 11-26. In this citation, Tamano further states that to “improve the firm formability and preventing the occurrence of pinholes, the [ethanol] solution... may contain a proper resin and a proper additive.” Therefore, Tamano recognized that its invention was susceptible to problems well-known in the art, namely that films formed by the wet method with certain solutions, such as ethanol, are prone to pinholes. Given that Tamano did not achieve the desired film with an ethanol solution, one of ordinary skill in the art would not be motivated to combine this reference with Tanaka in order to achieve the claimed invention.

Furthermore, one may appreciate how Applicants have claimed an invention that has met a long felt but unsolved need of creating films without pinholes when others have failed. Tamano, as indicated in the above citation, exemplifies the existence of an unsolved need and that others have failed to remedy it. Therefore, one of ordinary skill in the art would not find any suggestion or motivation in Tamano to make an organic compound that resolved these needs.

Additionally, “*a prima facie* case of obviousness may also be rebutted by showing that the art, in any material respect, teaches away from the claimed invention.” Given the fact that Applicants’ invention achieves the exact opposite result of the alcohol insoluble phosphorous compound disclosed in Tanaka, the Tanaka reference teaches away from the present invention and is not an appropriate basis for a finding of obviousness.

The aforementioned arguments apply to all of claims 1-4. Also, The Federal Circuit has clarified that if an independent claim is non-obvious under 35 U.S.C. § 103, then any claim depending therefrom is non obvious. *In re Fine*, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). Therefore,

all of the previous arguments that evidence claim 1's nonobviousness also apply to dependent claim 4.

Accordingly, Applicants respectfully request that this rejection be withdrawn.

Claims 1-4 are rejected to under 35 U.S.C. § 103(a) as being allegedly obvious over Murase et al. (JP2004-095221). This rejection is respectfully traversed. Reconsideration and withdrawal thereof are requested.

Murase discloses an electroluminescent device comprising an anode, a cathode, a hole transporting layer, which may be made of NPD, and an electron transporting layer, which may be made of a non-ionic phosphine compound. Murase discloses that electron transporting layers may be formed by the wet method. Despite Murase's disclosure, and as acknowledge by the examiner, Murase fails to disclose a device comprising the applicant's claimed invention.

Examiner offers no teaching, suggestion, or motivation in Murase for making the claimed invention. "[R]ejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR Int'l Co. v. Teleflex Inc.*, 82 U.S.P.Q.2d 1385, 1396 (2007). Examiner has stated in the pending office action that "[g]iven the teaching of Murase, it would have been obvious to one of ordinary skill in the art to make..." the claimed invention. See Office Action at 6. The only motivation the examiner has offered to use Murase is "to make an electroluminescent device with excellent thermal stability, high luminous efficiency, low drive voltage, and excellent color quality." See Office Action at 6. This alleged motivation is no more than a conclusory statement of the inventors' end goal. Although a formidable goal,

examiner offers no indication for how Murase may apply to achieve that motivation or goal.

Examiner has therefore offered no proper motivation and has failed to offer an “articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.”

Examiner’s assertions also ignore aspects of the Applicant’s invention. Murase fails to disclose, motivate, or suggest an “electron-transporting layer formed... by a wet method” with a compound that is “soluble in... alcohols.” Examiner rightly asserts that Murase teaches an electron-transporting layer formed by the wet method, See Murase para. [0060], but not one made with alcohol. In their application, Applicants have explained that electron-transporting layers made from a wet method with substances such as alcohols are novel, nonobvious, and present key advantages over the prior art. See Application page 4, lines 8-26.

Given the differences in wet methods disclosed in Murase and those posited by Applicants, there is no motivation for one of ordinary skill in the art to use the Murase disclosure. In fact, Murase teaches away from using the wet method, let alone one with alcohols, because no wet methods with alcohols are disclosed, and all of the examples in Murase favor different layer formation techniques.

Also, Murase’s disclosure of an electron-hole layer not does mention aspects of the layer that are important to Applicant’s invention, namely that it be alcohol insoluble. See Murase at para. [0015]. Assuming the hole-transporting layer in Murase is insoluble in alcohol, the disclosure lacks any teaching, suggestion, or motivation for using this type of layer in the manner posited by Applicants. Specifically, there is no discussion of how it would be advantageous to use a alcohol insoluble hole-transporting layer in conjunction with a alcohol soluble electron-

transporting layer. It is therefore not obvious to use the hole-transporting layer disclosed in Murase in the manner set forth by Applicants.

In sum, (1) there is no suggestion or motivation for combining the cited reference; (2) there is no reason to expect that the present invention would work by modifying the cited reference; and (3) the prior art does not teach or suggest all the features of the claimed invention.

The aforementioned arguments apply to all of claims 1-4. Also, The Federal Circuit has clarified that if an independent claim is non-obvious under 35 U.S.C. § 103, then any claim depending therefrom is non obvious. *In re Fine*, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). Therefore, all of the previous arguments that evidence claim 1's nonobviousness also apply to dependent claim 4.

Accordingly, Applicants respectfully request that this rejection be withdrawn.

Claims 1-4 are rejected to under 35 U.S.C. § 103(a) as being allegedly obvious over Murase et al. (JP2004-095221) in view of Sapochak et al. (WO 2005/073340). This rejection is respectfully traversed. Reconsideration and withdrawal thereof are requested.

The disclosure of Murase, along with the aspects it fails to disclose, are described above. The secondary reference, Sapochak, discloses organic phosphorus-containing, some of which are allegedly insoluble in alcohol. Sapochak alone fails to disclose a device comprising an anode, a hole transporting layer, an electron transporting layer, and a cathode. Sapochak also fails to disclose an electron transporting layer formed by the wet method or a hole transporting layer that is insoluble in alcohols.

All of the shortcomings of examiner's rejection that relied solely on Murase also apply to this rejection. Sapochak has been cited as allegedly disclosing certain phosphine compounds that are electron transporting, which does nothing to cure the defects of the rejection based solely on Murase. That is, (1) there is no suggestion or motivation for combining the two cited references; (2) there is no reason to expect that the present invention would work by modifying or combining the cited references; and (3) the prior art does not teach or suggest all the features of the claimed invention.

Sapochak does nothing to suggest, motivate, or teach the present invention, or specifically, the use of an alcohol insoluble hole-transporting layer in conjunction with an alcohol soluble electron-transporting layer. Furthermore, examiner has again been conclusory in their rationale for combining the cited references, and there is no articulated basis for why combining aspects of the cited references is obvious or why an inventor would find it obvious to use the cited references to achieve the properties of the present invention.

The aforementioned arguments apply to all of claims 1-4. Also, The Federal Circuit has clarified that if an independent claim is non-obvious under 35 U.S.C. § 103, then any claim depending therefrom is non obvious. *In re Fine*, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). Therefore, all of the previous arguments that evidence claim 1's nonobviousness also apply to dependent claim 4.

Accordingly, Applicants respectfully request that this rejection be withdrawn.

Claims 1-6 are rejected to under 35 U.S.C. § 103(a) as being allegedly obvious over Matsuura et al. (JP 2003-317965). This rejection is respectfully traversed. Reconsideration and withdrawal thereof are requested.

Matsuura discloses that electroluminescent devices may comprise an anode, a cathode, a hole transporting layer, and an electron transporting layer sandwiched between two electrodes. The disclosure states that the hole transporting layer may be composed of NPD, which is alcohol insoluble. Matsuura discloses that the electron transporting layer may be made by spin coating and be composed of a phosine compound or a phosphorus-containing organic compound that does not contain oxygen. Matsuura fails to disclose compounds that read on Applicants' formulas (2) and (3).

Applicants note that in crowded and competitive fields, a modification that achieves a valuable improvement is of significance in view of the many entrants seeking commercial advantage. *In re Hummer*, 241 F.2d 742, 744 (C.C.P.A. 1957). "Progress is as important, however, in crowded art as well as in those which are in the pioneer state." *Id.* Applicants' invention falls within a crowded art, as evidenced by the fact that a number of references cited by the examiner have electron-transporting layers formed with phosphorus-containing compounds.

The examiner has stated that the motivation for using Matsuura is that electroluminescent devices that use phosphorous containing compounds have improved luminescence, luminosity, and lifetime. This is hardly a proper motivation for using Matsuura, though, as evidenced by the fact that several cited references use such phosphorous compounds for presumably the same reasons. In conclusion, examiner should not render Applicants' compounds obvious merely

because they are similar to those in prior art, but rather should place a high value on Applicant's ability to find novel solutions within this crowded field.

More specifically, examiner argues that one of ordinary skill in the art could have made a compound that read on Applicant's formulas (2) and (3) by making a compound similar to Matsuura's formula (5) and incorporating the oxides disclosed in Matsuura's formula (6). The resulting compound would allegedly share the characteristics of applicant's formula (J).

This logic would require one of ordinary skill in the art to find it obvious to take one formula (5), modify its structure, and incorporate the oxides present in another structure (3). Contrarily, the reference contains no motivation or suggestion for constructing a compound with this combination of traits. Also, examiner has stated that the resulting structure would be similar to Applicant's formula (J), but this a weak basis for finding subformulas (2) and (3) obvious because formula (J) is disclosed as an example of subformula (7). See Application at 31.

In conclusion, examiner has cited no rationale, aside from structural similarity, for transforming formula (5) of Matsuura into the compound of the present invention. Therefore, there is a complete lack of motivation for making Matsuura's compounds into the present compounds. Also, the obviousness rejections based on chemical similarities does not hold in a this crowded field where slight chemical variations may represent nonobvious and valuable innovation. Additionally, even with the presence of structure similarity, the burden is on the examiner to show an objective expectation that compounds similar in structure are expected to have similar properties. Here examiner has presented to such evidence.

The aforementioned arguments apply to all of claims 1-6. Also, The Federal Circuit has clarified that if an independent claim is non-obvious under 35 U.S.C. § 103, then any claim

depending therefrom is non obvious. *In re Fine*, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). Therefore, all of the previous arguments that evidence claim 1's nonobviousness also apply to dependent claim 4-5.

Accordingly, Applicants respectfully request that this rejection be withdrawn.

If the Examiner has any questions concerning this election or the Application in general, he is respectfully requested to contact the undersigned at the number listed below.

Respectfully submitted,



Richard S. Myers, Jr.
Registration No. 42,022
STITES & HARBISON
Customer No. 32885
Attorneys for Applicant